Mallam 184

CARIBOU TAGGING PROJECT, KOUKDJUAK RIVER BAFFIN ISLAND, NORTHWEST TERRITORIES, 1982

Northwest Territories Renewable Resources
Wildlife Service
The Honourable Nellie Cournoyea, Minister

103-05780/

CARIBOU TAGGING PROJECT, KOUKDJUAK RIVER BAFFIN ISLAND, NORTHWEST TERRITORIES, 1982

PAUL G. KRAFT

N.W.T. WILDLIFE SERVICE

1984

Northwest Territories Renewable Resources

File Report No. 41

Contents of this paper may be used only with the permission of the N.W.T. Wildlife Service.

ABSTRACT

Between 16 July and 15 August, 1982, a four-man crew on the Koukdjuak River, Baffin Island, Northwest Territories, ear tagged, sexed and aged 382 barren-ground caribou (Rangifer tarandus groenlandicus). The tagged caribou sample was comprised of 58% adult females, 6% adult males, 15% yearlings, and 21% calves. Of the tagged adult females, 48% had firm udders, 1% had soft udders, and 51% did not have udders. Only two tagged caribou were recaptured and 9 of 49 caribou found drowned were tagged. Daily observations recorded 3931 caribou, with the average number of caribou observed per hour being 24.4.

TABLE OF CONTENTS

ABSTRACT iii

LIST OF FIGURES vii

LIST OF TABLES vii

INTRODUCTION 1

METHODS 5

RESULTS 6

DISCUSSION 15

ACKNOWLEDGEMENTS 18

LITERATURE CITED 19

APPENDIX A. Tagged caribou data, 16 July to 15 August, 1982, Koukdjuak River, Baffin Island, N.W.T. 20

APPENDIX B. Daily caribou observations, Sections 1 to 4 of the Koukdjuak River, 16 July to 15 August, 1982 29

APPENDIX C. Bird sightings along the Koukdjuak River, 16 July to 15 August, 1982 35

LIST OF FIGURES

Figure 1.	Koukdjuak River, southern Baffin Island, Northwest Territories	2
Figure 2.	Caribou crossing areas and observation sections along the Koukdjuak River	4

LIST OF TABLES

Table 1.	Age and sex of caribou tagged on the Koukdjuak River, 16 July to 15 August, 1982	7
Table 2.	Breeding condition of adult female caribou tagged on the Koukdjuak River, 16 July to 15 August, 1982	8
Table 3.	Segregation of observed caribou, groups containing individuals of unknown sex and age excluded along the Koukdjuak River, 16 July to 15 August, 1982	9
Table 4.	Age and sex of caribou observed daily along the Koukdjuak River, 16 July to 15 August, 1982	10
Table 5.	Caribou found dead along the Koukdjuak River, 16 July to 15 August, 1982	12

INTRODUCTION

The tagging and recording of biological information on caribou (Rangifer tarandus groenlandicus) migrating across the Koukdjuak River, Baffin Island, Northwest Territories, was undertaken between 16 July and 15 August, 1982. This was the eighth consecutive year caribou have been tagged on the Koukdjuak River. The previous operations have been reported on by Redhead (1975, 1976), Popko (1977, 1978, 1979), and Kraft (1980, 1981). The long-term objective of the study is to determine caribou wintering areas on Baffin Island through tag returns by hunters. Other objectives include the collection of data on the reproductive status of adult females, calf production and survival, segregation of tagged and observed caribou by sex and age, water crossing dates, and the number of caribou using the Koukdjuak River crossing.

The Koukdjuak River drains west from Nettilling Lake into Foxe Basin and is located on the Great Plain of the Koukdjuak (Fig. 1). The river is about 75 km long and varies in width from 1.2 to 5.7 km. The depth of the river is variable, depending on the timing of the spring run-off and ice break-up on Nettilling Lake. South of the river the Plain is almost featureless, crossed by many small streams and covered by many small circular ponds. North of the river, the Plain is crossed by raised beaches.

Caribou arrive at the north shore of the river in mid to late June from calving grounds located in the area of the Dewar Lakes

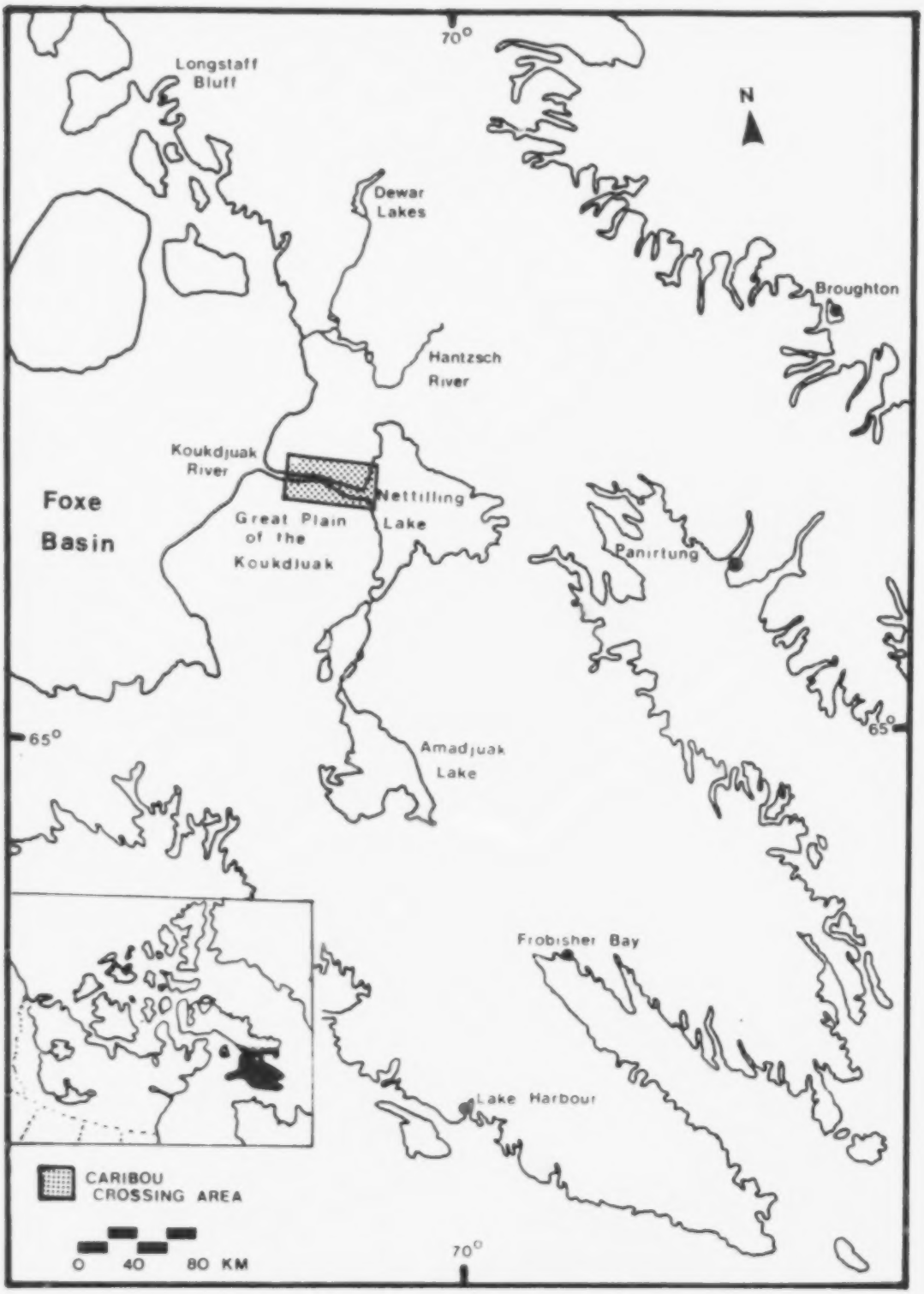

Figure 1. Koukdjuak River, southern Baffin Island, Northwest Territories.

and Longstaff Bluff. The caribou do not immediately move south across the river, but travel eastward, resting and grazing. The majority of the caribou, observed by the tagging crew, cross the the river from a set of islands 20 km from Nettilling Lake, and from Niko Island and its surrounding islands (Fig. 2).

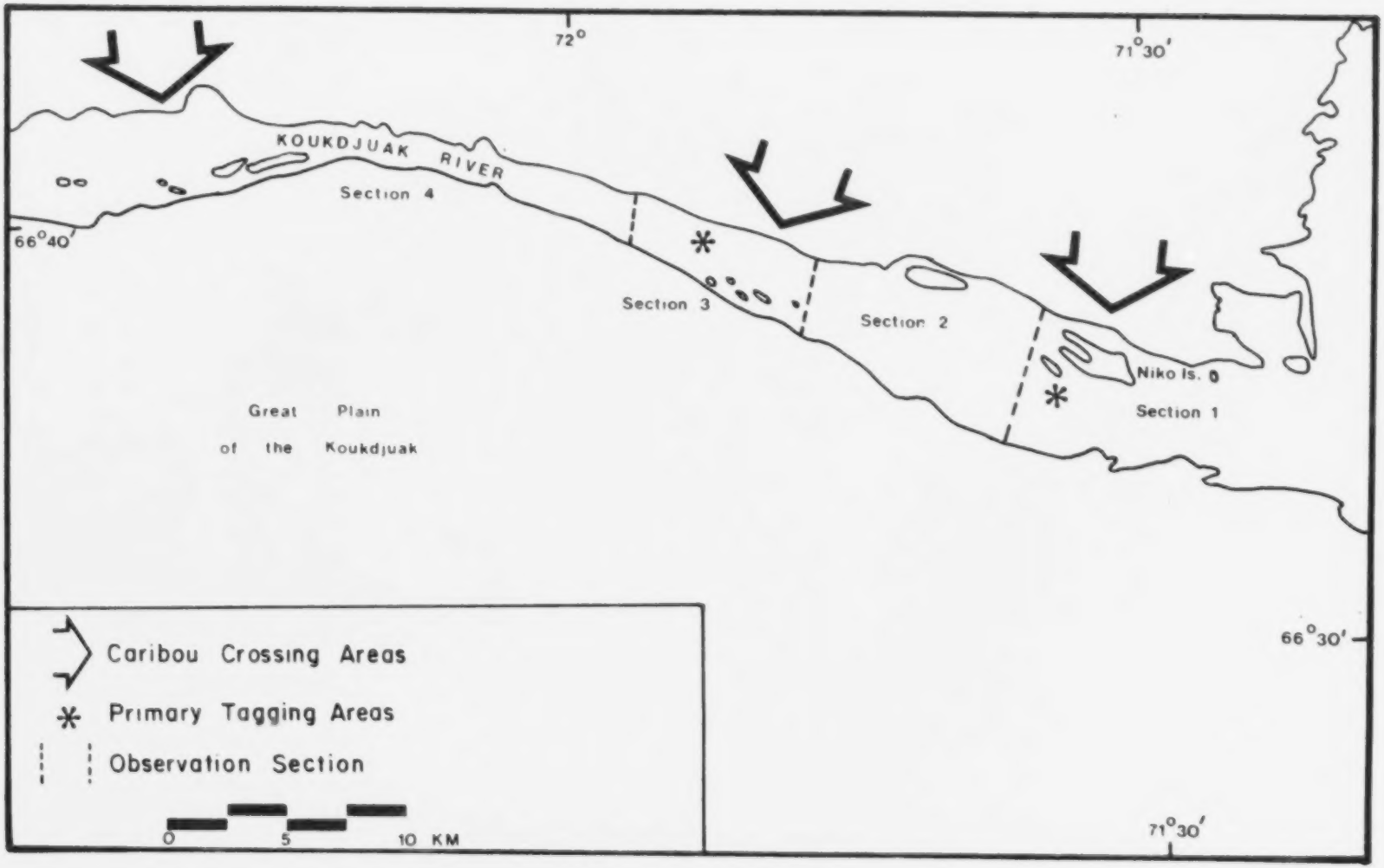

Figure 2. Caribou crossing areas and observation sections along the Koukdjuak River.

METHODS

Capture and tagging techniques used on the Koukdjuak River were similar to those of previous years (Popko 1977). A four-man crew based at Niko Island on the Koukdjuak River patrolled the river by canoe searching for groups of caribou.

Red plastic "Temple Country Giant" ear tags were used. On one side of the tags consecutive numbers from 1 to 385 and the year, 1982, were printed. The other side was printed with "10.00 REWARD". The tags measured 5 x 5 cm and were 2 mm thick. Insertion into the ear was made by cutting the ear with a knife-like instrument manufactured by "Starbar".

After the animals were tagged, a record was made of the tag number, sex, reproductive status, and age (adult, yearling, or calf). Adult cows were classified as having either a firm udder, a soft udder, or no udder. Cows with enlarged firm udders were considered to be accompanied by a calf, and cows with no udder development either did not produce a calf or had lost a calf shortly after birth and the udder, by this time, had completely degenerated. Cows that had recently lost a calf had loose and flabby udders.

Daily caribou observations were recorded by location and time. The number of hours per day in which observations were made represented the hours of observer effort. The river was arbitrarily divided into four sections to identify locations of observations (Fig. 2). Information on the sex and age of observed caribou were recorded. Groups containing individuals which could not be identified were noted.

RESULTS

There were 382 caribou tagged and segregated on the Koukdjuak River in July and August, 1982 (Table 1, Appendix A). Thirteen of the 31 days the crew spent at Niko Island were spent tagging. No caribou were observed crossing on 5 days. Access to the river during the balance of the study was not possible due to inclement weather or ice present in the water.

All caribou were captured along a 22 km section of the river west of Nettilling Lake. Of the caribou tagged, 58.4% were adult females, 20.7% calves, 15.4% yearlings, and 5.5% were adult males (Table 1). Of the 223 adult females only 47.9% had firm udders while 51.1% had no discernible udders (Table 2). The male:female ratio of tagged caribou was 103:100 for calves, 44:100 for yearlings, and 9:100 for adults (Table 1).

Of the 404 caribou segregated from groups with complete information, 54.2% were adult females, 25.7% were calves, 14.1% were yearlings and 5.9% were adult males (Table 3). The age and sex composition obtained from the 3931 caribou observed were slightly different because it included caribou from groups containing unknown individuals (Table 4). There were 219 groups of caribou observed during 161 hours of river patrol for an average of 24.4 caribou per hour (Table 4). Most (83%) of the caribou observed were in Section 1 of the river (Appendix B). Only two tagged caribou were recaptured; both were adult females tagged in 1979. Forty-nine dead caribou were found on the islands and along the shores of the river (Table 5). Adult females

Table 1. Age and sex of caribou tagged on the Koukdjuak River, 16 July to 15 August, 1982.

Date 1982		Age[a] - sex[b] segregation						
		C-M	C-F	Y-M	Y-F	A-M	A-F	Total
July	18	0	2	0	3	0	8	13
	23	1	0	0	0	0	1	2
	24	1	5	5	8	7	34	60
	26	2	4	1	2	0	8	17
	28	15	11	7	22	3	94	152
August	1	0	0	0	0	0	1	1
	6	1	2	2	1	6	13	25
	8	1	1	0	0	0	0	2
	9	3	0	0	1	0	6	10
	10	9	5	1	4	2	30	51
	11	0	6	2	0	1	16	25
	13	2	1	0	0	0	3	6
	14	5	2	0	0	2	9	18
Total		40	39	18	41	21	223	382
%		10.5	10.2	4.7	10.7	5.5	58.4	100

a - "C" refers to calf; "Y", yearlings; "A", adult.
b - "M" refers to male; "F", Female.

Table 2. Breeding condition of adult female caribou tagged on the Koukdjuak River, 16 July to 15 August 1982.

Date 1982		Condition of udders			Total
		Firm	Soft	None	
July	18	2	0	6	8
	23	1	0	0	1
	24	13	21	0	33
	26	6	2	0	8
	28	46	47	1	94
August	1	0	1	0	1
	6	1	12	0	13
	8	0	0	0	0
	9	3	3	0	6
	10	22	8	0	30
	11	7	9	0	16
	13	2	1	0	3
	14	4	4	1	9
Total		107	2	114	223
%		47.9	0.9	51.1	100

Table 3. Composition of caribou groups completely segregated along the Koukdjuak River, 16 July to 15 August, 1982.

Date 1982	Age[a] - sex[b] segregation				Number of groups	Total
	A-M	A-F	Y	C		
July						
17	0	14	4	2	3	20
18	0	8	3	2	3	13
19	0	0	4	0	1	4
23	2	0	0	0	1	2
24	16	34	13	6	3	69
25	0	59	12	37	4	108
26	0	7	4	3	3	14
27	1	9	1	6	3	17
28	3	53	12	27	8	95
August						
1	0	1	0	3	1	4
3	0	1	0	1	1	2
6	0	2	0	2	1	4
7	0	1	0	2	2	3
8	0	2	1	1	1	4
10	1	12	1	4	1	18
11	1	12	2	4	1	19
13	0	3	0	3	1	6
14	0	1	0	1	1	2
Total	24	219	57	104	39	404
%	5.9	54.2	14.1	25.7	-	100

a - "A" refers to adult; "Y", yearling, "C", calf.
b - "M" refers to male; "F", female.

Table 4. Composition of caribou groups observed along the Koukdjuak River, 16 July to 15 August, 1982.

Date 1982	Age[a] - sex[b] segregation					Number of groups	Total caribou	Hours of observation	Caribou/hr
	A-M	A-F	Y	C	UK				
July 16	-	-	-	-	63	10	63	5	12.6
17	-	14	4	3	103	9	124	10	12.4
18	2	8	3	2	230	15	245	11	22.3
19	-	1	4	1	588	13	594	12	49.5
20	3	-	-	-	391	8	394	6	66.0
21	-	-	-	-	128	24	128	7	18.3
22	-	2	-	2	22	5	26	6	4.3
23	2	5	-	5	95	5	107	5	21.4
24	7	34	13	6	93	3	153	3	51.0
25	1	97	19	57	169	13	343	8	42.9
26	1	19	5	15	200	13	240	9	26.7
27	2	16	1	13	56	7	88	5	17.6
28	6	147	40	53	67	14	313	8	39.1
31	-	-	-	-	21	2	21	4	5.3
August 1	-	1	-	3	13	5	17	3	5.7
2	-	-	-	-	3	1	3	2	1.5
3	-	2	-	3	18	5	23	5	4.6
4	1	1	-	1	12	1	15	1	15.0
5	-	-	-	-	55	3	55	3	18.3
6	11	15	3	5	295	11	329	8	41.1
7	-	5	-	6	57	9	68	6	11.3
8	-	7	1	6	56	6	70	4	17.5
9	-	11	1	8	119	7	139	5	27.8
10	2	31	5	15	69	10	122	9	13.6
11	1	20	2	10	52	5	85	4	2.7
12	-	1	-	1	6	2	8	3	9.3
13	-	4	-	9	24	5	37	4	24.2
14	-	4	-	4	113	8	121	5	

Table 4 continued

Date 1982	Age[a] - sex[b] segregation					Number of groups[c]	Total caribou	Hours of observation	Caribou/hr
	A-M	A-F	Y	C	UK				
Total	39	445	101	228	3118	219	3931	161	24.4
%	4.8	57.7	12.4	28.0	-		100		

a - "A" refers to adult; "Y", yearling; "C", calf.
b - "M" refers to male; "F", female; "UK", unknown sex or age.
c - Includes groups with individuals of unknown sex or age.

calves : 100 1+females = 228/445 + female yrlngs.

Table 5. Caribou found dead along the Koukdjuak River, 16 July to 15 August, 1982.

Date 1982	Sex[a]	Age[b]	River section	Tag	Date tagged	S-T[c]	A-T[d]
July							
21	UK	UK	3	UK	-	-	-
21	UK	UK	3	UK	-	-	-
21	UK	UK	3	UK	-	-	-
26	F	A	3	-	-	-	-
26	F	A	1	7349/75	21/07/75	F	A
26	F	Y	3	-	-	-	-
28	F	A	3	-	-	-	-
August							
1	F	A	1	333/80	10/08/80	F	A
1	F	Y	1	-	-	-	-
1	F	A	3	-	-	-	-
1	F	A	3	-	-	-	-
1	F	C	3	-	-	-	-
1	F	C	3	-	-	-	-
1	F	A	3	-	-	-	-
1	M	C	3	-	-	-	-
1	M	Y	3	-	-	-	-
1	F	C	3	-	-	-	-
1	F	C	3	-	-	-	-
1	F	Y	3	-	-	-	-
1	F	A	3	169/82	28/07/82	F	A
1	F	A	3	-	-	-	-
1	F	A	1	-	-	-	-
1	F	A	1	-	-	-	-
1	M	C	1	-	-	-	-
1	M	C	1	-	-	-	-
3	F	A	2	-	-	-	-
3	F	A	2	-	-	-	-
3	M	C	3	-	-	-	-
3	F	A	3	-	-	-	-
3	M	Y	3	-	-	-	-
3	F	A	3	45/82	24/07/82	F	A
3	F	A	1	30/81	23/07/81	F	A
3	F	C	1	155/82	28/07/82	M	C
3	M	C	1	149/82	28/07/82	M	C
5	UK	C	4	-	-	-	-
5	UK	C	4	-	-	-	-
5	UK	C	4	-	-	-	-
5	UK	C	4	-	-	-	-
5	UK	C	4	-	-	-	-
5	UK	C	4	-	-	-	-
5	F	A	4	-	-	-	-
5	F	A	4	-	-	-	-

Table 5 continued

Date 1982	Sex[a]	Age[b]	River section	Tag	Date tagged	S-T[c]	A-T[d]
10	F	A	3	-	-	-	-
10	F	C	3	-	-	-	-
10	F	Y	3	-	-	-	-
10	F	A	3	-	-	-	-
10	F	C	3	-	-	-	-
10	F	A	1	162/75	21/07/75	F	A
14	F	A	3	Blank	UK	UK	

a - "F" refers to female; "M, male; "UK", unknown.
b - "A" refers to adult; "Y", yearling; "C", calf; "UK", unknown.
c - "S-T" refers to sex of caribou recorded at tagging.
d - "A-T" refers to age of caribou recorded at tagging.

comprised 44.9%, calves 36.7% and yearlings 12.2% of the carcasses. Nine of the animals were tagged, although only four were tagged in 1982.

Only one wolf was sighted in the study area, and 23 species of birds were recorded (Appendix C). Lemmings and arctic fox were sighted on a few occasions.

DISCUSSION

As during most years of tagging work on the Koukdjuak River, the crew was limited in its efforts by poor weather and ice in the river. Most of the caribou crossed the river between 24 and 29 July and between 9 and 11 August in Sections 1, 2, and 3. One trip was made to Section 4 of the river, few caribou were observed along the shore and none were tagged in this section.

Sex and age ratios of observed caribou (excluding groups containing individuals of unknown sex or age) were compared with data obtained in 1981. Only slight differences were noted as follows: adult males decreased 1.0%, adult females increased 0.5%, yearlings increased 4.0%, and calves decreased 3.5%. By using data obtained from groups of caribou where each individual was identified, observer bias was reduced. Previously, observers assumed that the number of cows at least equalled the number of calves observed. Mature adult males tended to be counted first, as they were the easiest animals to identify. Thus, when animals of unknown sex and age were included, the data were biased in favour of calves and adult males.

The percentage of calves tagged in 1982 decreased 14.9% from the number tagged in 1981. However, data from caribou observations indicated a drop of only 3.5% from 1981. The percentage of yearlings tagged in 1982 increased significantly from the number tagged in 1981 (11.6%). This increase was also reflected by the increase in the number of yearlings observed along the river. The increase in the number of yearlings tagged

and observed may be a function of the high percentage of calves observed in 1981 (29.2%) and may indicate a low mortality rate of calves during the winter of 1981-82. The sex ratio of tagged calves was found to be virtually equal, the male to female ratio of tagged yearlings was much lower. The phenomenon has also been noted by Popko (1977, 1978, 1979) and (Kraft 1980, 1981). In conjunction with this observation, the male to female ratio of tagged adults was found to be 9:100, the lowest observed since the project began in 1974. These data confirm the partitioning of yearling and adult males away from the study area.

The first year mortality rate was indicated by the ratio of calves tagged in 1981 to the number of yearlings tagged in 1982; for males, the ratio was 100:27; for females, 100:62; with a combined calf to yearling ratio of 100:45. If it is assumed that all yearling females migrate to the calving grounds with the adult females, the calf to yearling ratio for females would represent the first year mortality rate (38%). For male yearlings the ratio shown would not be accurate since not all male yearlings return to the calving grounds.

The percentage of adult female caribou tagged and observed was slightly higher than obtained in 1981. There was little change in the percentage of tagged cows with firm udders (-0.05%), while the number of females without udders increased (2.2%). The increase in the proportion of cows without udders may have been a result of more calves being lost shortly after calving. The ratio of observed calves to cows was 48:100, while the ratio of tagged calves to cows was 35:100. It is probable that the ratio obtained

from observation data is the more accurate figure, as the tagging crew may have been unintentionally biased in their selection of animals for tagging. Some bias, reducing the number of tagged calves, was suggested because the percentage of tagged females with calves (47.9%) was similar to the ratio of observed calves to cows.

Data obtained from 1982 caribou observations indicated a reduction from 1981 in the number of caribou using the Koukdjuak River crossing. Only 24.4 caribou were observed per hour, compared with 42.1 in 1981.

avoidance?

ACKNOWLEDGEMENTS

The tagging crew based on Niko Island consisted of Mathew Saviakjuk of Cape Dorset, Guy Veevee of Frobisher Bay, and Lyta Eyeevadlook of Lake Harbour. Seemeega Aqpik and Michael Ferguson of the Department of Renewable Resources assisted in the collection of segregation data and initiated a caribou mortality study along the river. Radio communication with Frobisher Bay was maintained daily by Jim Noble, Department of Renewable Resources, and by the personnel of the Department of Indian Affairs and Northern Development.

Filming of the tagging operation was carried out by David Poisey, Bill Stewart and Gary Milligan, Department of Information, Yellowknife. Ed Hall, Supervisor, Conservation Education, wrote the script for the film and assisted the cameramen.

LITERATURE CITED

Kraft, P.G. 1980. Baffin Island caribou survey. Report on the 1980 tagging program. N.W.T. Wildl. Serv. unpubl. rep. 39 pp.

Kraft, P.G. 1981. Baffin Island caribou survey. Report on the 1981 tagging program. N.W.T. Wildl. Serv. unpubl. rep. 34 pp.

Popko, R. 1977. Baffin Island caribou survey. Report on the 1977 tagging program. N.W.T. Fish and Wildl. Serv. unpubl. rep. 40 pp.

Popko, R. 1978. Baffin Island caribou survey. Report on the 1978 tagging program. N.W.T. Fish and Wildl. Serv. unpubl. rep. 51 pp.

Popko, R. 1979. Baffin Island caribou survey. Report on the 1979 tagging program. N.W.T. Wildl. Serv. unpubl. rep. 34 pp.

Redhead, R. 1975. Baffin Island caribou survey. Report on the 1975 tagging program. N.W.T. Fish and Wildl. Serv. unpubl. rep. 49 pp.

Redhead, R. 1976. Baffin Island caribou survey. Report on the 1976 tagging program. N.W.T. Fish and Wildl. Serv. unpubl. rep. 49 pp.

Appendix A. Tagged caribou data, 16 July to 15 August, 1982, Koukdjuak River, Baffin Island, Northwest Territories.

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
July 18	1	F	Y	
	2	F	A	BN
	3	F	A	BN
	4	F	A	BN
	5	F	A	WC
	6	F	Y	
	7	F	A	BN
	8	F	A	BN
	9	F	Y	
	10	F	C	
	11	F	A	WC
	12	F	A	BN
	13	F	C	
July 23	14	F	A	WC
	15	M	C	
July 24	16	F	A	BN
	17	F	A	BN
	18	F	A	BN
	19	F	A	WC
	20	F	Y	
	21	F	C	
	22	M	A	
	23	F	A	BN
	24	M	Y	
	25	F	A	BN
	26	F	A	BN
	27	F	A	WC
	28	F	A	BN
	29	M	Y	
	30	F	A	BN
	31	F	A	BN
	32	F	Y	
	33	F	Y	
	34	F	A	BN
	35	M	Y	
	36	F	A	BN
	37	F	A	BN
	38	F	A	BN
	39	M	A	
	40	F	Y	
	41	F	A	BN
	42	M	A	
	43	F	Y	
	44	M	C	with #45/82
	45	F	A	WC, found dead

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
	46	F	C	with #48/82
	47	M	Y	
	48	F	Y	WC
	49	F	A	
	50	M	A	
	51	F	A	
	52	F	A	WC
	53	F	A	BN
	54	F	A	BN
	55	F	A	BN
	56	F	A	BN
	57	F	A	BN
	58	F	A	BN
	59	M	A	
	60	M	A	
	61	M	Y	
	62	F	A	WC
	63	F	A	WC
	64	F	A	WC
	65	F	C	
	66	F	A	BN
	67	F	Y	
	68	F	A	BN
	69	M	A	broken antler
	70	F	A	WC
	71	F	A	WC
	72	F	C	with #71/82
	73	F	A	WC
	74	F	Y	
	75	F	C	with 73/82
July 26	76	F	A	WC
	77	M	Y	
	78	F	C	
	79	F	A	BN
	80	M	C	
	81	F	A	BN
	82	F	C	
	83	F	A	WC
	84	F	C	with #83/82
	85	F	A	WC
	89	M	C	
	90	F	C	
	91	F	A	WC
	92	F	A	WC
July 28	93	F	A	WC
	94	F	A	WC

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
July 28	95	F	C	
	96	F	C	
	97	F	C	
	98	F	A	WC
	99	F	A	WC
	100	F	A	WC
	101	M	C	
	102	F	A	BN
	103	F	A	BN
	104	F	A	BN
	105	F	A	BN
	106	F	A	WC
	107	M	Y	
	108	M	C	
	109	F	A	WC
	110	F	C	with #109/82
	111	F	A	BN
	112	F	A	WC
	113	M	C	
	114	F	A	BN
	115	F	Y	
	116	F	A	BN
	117	F	A	BN
	118	F	A	WC
	119	F	Y	
	120	F	Y	
	121	F	A	BN
	122	F	A	WC
	123	F	A	BN
	124	F	A	WC
	125	F	A	BN
	126	F	A	WC
	127	F	A	BN
	128	F	A	BN
	129	F	A	BN
	130	F	Y	
	131	F	A	WC
	132	F	A	BN
	133	F	A	BN
	134	F	A	BN
	135	F	A	BN
	136	F	A	WC
	137	F	C	with #136/82
	138	F	A	BN
	139	F	Y	
	140	F	A	BN
	141	F	A	WC

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
July 28	142	F	Y	
	143	M	C	with #141/82
	144	F	A	WC
	145	F	C	with #144/82
	146	M	Y	
	147	F	A	WC
	148	M	C	with #147/82 found dead
	149	M	C	
	150	F	A	WC
	151	M	C	
	152	F	A	WC broken antler
	153	F	A	WC
	154	F	A	WC
	155	M	C	with #153/82 found dead
	156	F	A	WC
	157	F	A	BN
	158	F	A	BN
	159	F	A	WC
	160	F	A	BN
	161	F	A	BN
	162	F	A	BN
	163	F	A	WC
	164	F	C	with #163/82
	165	F	A	BN
	166	F	A	BN
	167	F	Y	
	168	F	A	BN
	169	F	A	WC, found dead
	170	M	Y	
	171	F	A	WC
	172	M	C	with #171/82
	173	F	A	WC
	174	F	Y	
	175	F	Y	
	176	F	Y	
	177	F	A	BN
	178	F	A	WC
	179	F	A	BN
	180	M	A	
	181	F	A	WC
	182	F	A	BN
	183	M	C	
	184	F	A	BN

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
July 28	185	F	A	BN
	186	F	Y	
	187	F	A	BN
	188	F	A	BN
	189	F	A	BN
	190	F	A	BN
	191	F	A	WC
	192	F	C	with #191/82
	193	F	A	BN
	194	F	A	WC
	195	F	C	
	196	F	A	WC
	197	F	A	BN
	198	F	A	WC
	199	F	A	BN
	200	F	A	BN
	201	M	C	
	202	F	A	WC
	203	F	A	BN
	204	F	A	WC
	205	M	C	with #204/82
	206	F	A	WC
	207	F	C	
	208	M	A	
	209	F	A	BN
	210	F	A	BN
	211	F	A	WC
	212	M	Y	
	213	F	A	BN
	214	F	A	WC
	215	M	Y	
	216	F	C	
	217	F	A	WC
	218	F	C	
	219	F	A	WC
	220	M	C	
	221	M	Y	
	222	F	A	BN
	223	F	A	WC
	224	F	A	BN
	225	F	Y	
	226	F	Y	
	227	F	A	BN
	228	F	Y	
	229	F	Y	
	230	F	A	WC
	231	F	Y	

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
July 28	232	F	A	WC
	233	M	Y	
	234	M	Y	
	235	F	Y	
	236	F	Y	
	237	F	Y	
	238	F	A	WC
	239	M	C	
August 1	240	F	A	BN, very weak
August 6	241	F	A	BN
	242	F	C	
	243	F	A	BN
	244	M	Y	
	245	M	Y	
	246	F	A	BN
	247	M	A	
	248	F	A	BN
	249	F	A	BN
	250	F	A	BN
July 28	251	F	A	WC
	252	F	Y	
	253	F	A	LC
	254	M	C	
	255	M	A	
August 6	256	M	C	
	257	F	A	BN
	258	-	-	lost tag
	259	F	A	WC
	260	F	A	BN
	261	F	A	BN
	262	F	C	
	263	F	A	BN
	264	M	A	
	265	M	A	
	266	F	A	BN
	267	F	Y	
	268	F	A	BN
	269	M	A	
	270	M	A	
	271	M	A	
August 8	272	F	C	
	273	M	C	
August 9	274	M	C	
	275	F	A	
	276	F	Y	
	277	M	C	

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
August 9	278	F	A	BN
	279	F	A	WC
	280	F	A	WC
	281	F	A	BN
	282	F	A	BN
	283	-	-	lost tag
	284	M	C	
August 10	285	F	A	WC
	286	F	A	WC
	287	F	C	
	288	M	A	
	289	F	A	BN
	290	F	A	WC
	291	M	C	with #290/82
	292	M	C	
	293	F	A	WC
	294	M	C	with #293/82
	295	F	A	BN
	296	F	Y	
	297	M	C	
	298	F	A	WC
	299	F	C	with #298/82
	300		F	A WC
	301	F	A	WC
	302	F	A	WC
	303	-	-	lost tag
	304	F	A	WC
	305	F	A	BN
	306	F	A	BN
	307	F	Y	
	308	F	A	BN
	309	M	Y	
	310	M	C	
	311	F	A	WC
	312	F	C	
	313	F	Y	
	314	F	A	WC
	315	M	C	
	316	F	A	WC
	317	F	A	WC
	318	M	C	with #316/82
	319	M	C	with #320/82
	320	F	A	WC
	321	F	A	WC
	322	F	C	
	323	F	A	WC
	324	F	C	with #323/82

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
August 10	325	M	A	
	326	F	A	BN
	327	F	A	WC
	328	F	A	WC
	329	F	A	WC
	330	F	A	BN
	331	F	A	BN
	332	F	A	WC
	333	F	A	WC
	334	F	Y	
	335	F	A	WC
	336	M	C	with #335/82
August 11	337	M	C	
	338	F	A	WC
	339	F	A	BN
	340	F	A	BN
	341	F	C	
	342	F	A	WC
	343	F	A	BN
	344	F	C	with #342/82
	345	F	A	WC
	346	F	C	with #345/82
	347	F	A	WC
	348	F	A	WC
	349	F	A	WC
	350	M	A	
	351	F	A	BN
	352	F	A	BN
	353	F	A	BN
	354	F	C	
	355	F	A	BN
	356	F	A	WC
	357	F	C	
	358	M	Y	
	359	M	Y	broken antler
	360	F	A	BN
	361	F	A	BN
August 13	362	F	A	WC
	363	M	C	
	364	F	C	with #364/82
	365	F	A	WC
	366	M	C	
	367	F	A	BN
August 14	368	F	A	WC
	369	M	C	
	370	F	C	

Appendix A. continued

Date	Tag number	Sex[a]	Age[b]	Remarks[c]
August 14	371	F	A	WC
	372	F	A	BN, broken antler
	373	M	C	split ear
	374	F	A	LC
	375	M	C	
	376	F	A	WC
	377	M	C	
	378	F	C	
	379	F	A	BN, broken antler
	380	F	A	WC
	381	F	A	BN
	382	M	A	broken antler
	383	M	A	
	384	M	C	split ear
	385	F	A	BN

a - "M" refers to male; "F", female.
b - "A" refers to adult; "Y", yearling; "C", calf.
c - "WC refers to a cow with a calf; "BN" a barren cow; "LC", cow that lost a calf.

Appendix B. Daily caribou observations in Sections 1-4 on the Koukdjuak River, 16 July to 15 August, 1982.

Appendix B-1. Daily caribou observations, Section 1 of the Koukdjuak River, 16 July to 15 August, 1982.

Date	Time Slot																
1982	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
July																	
16	-	-	-	-	-	-	-	-	-	-	-	4	0	-	-	2	-
17	-	-	0	18	-	-	-	10	0	0	0	13	-	-	33	0	-
18	-	-	-	5	6	132	45	1	-	-	-	-	6	-	-	5	-
19	-	-	7	-	-	0	0	4	-	9	14	6	52	7	495	-	-
20	-	-	144	-	-	-	-	4	-	-	60	-	-	16	68	102	-
21	-	-	-	-	5	-	16	-	-	-	-	-	-	2	-	0	-
22	-	-	-	-	-	2	11	-	2	-	0	3	8	-	-	-	-
23	-	-	-	-	25	-	-	-	3	-	-	-	75	2	-	-	-
24	-	14	-	130	-	-	-	-	-	-	-	-	-	9	-	-	-
25	-	-	-	63	-	-	-	43	-	-	-	-	80	64	84	9	-
26	-	-	-	-	60	4	76	-	75	-	-	-	-	-	-	-	-
27	-	-	9	-	-	4	9	-	37	-	-	-	-	-	-	29	-
28	-	-	28	-	17	-	4	-	5	-	21	-	-	48	-	-	70
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	1	20	-	-	-	0	0	-	-	-	-	-	-	-	-
August																	
1	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-
2	-	-	-	0	-	-	-	-	3	-	-	-	-	-	-	-	-
3	-	-	-	0	-	-	-	-	-	-	-	-	-	-	11	-	-
4	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	10	-	35	-	-	-	-	-	-	10	-	-	-
6	7	4	-	-	11	-	-	61	-	-	-	160	-	-	8	78	-
7	-	-	-	-	31	-	-	16	-	-	-	10	1	-	-	-	-
8	-	-	-	23	-	4	30	-	-	-	-	-	-	13	-	-	-
9	-	-	-	31	-	-	-	-	-	-	-	-	-	71	19	-	-
10	-	-	-	-	-	9	-	2	13	-	-	-	18	14	30	-	-

Appendix B-1. continued

Date	Time Slot																
1982	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
11	-	-	13	-	-	-	49	-	-	-	-	-	-	19	4	-	-
12	-	-	0	-	-	-	5	-	-	-	-	-	-	3	-	-	-
Total	22	18	202	290	167	164	279	141	138	9	95	196	240	278	725	225	70

Total caribou observed in Section 1 - 3,259

Appendix B-2. Daily caribou observations, Section 2 of the Koukdjuak River, 16 July to 15 August, 1982.

Date 1982	Time Slot 0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
July 28	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-
August 14	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	30	-	-	-	-	-	-	-	48	-	-	-

Total caribou observed in Section 2 - 78

Appendix B-3. Daily caribou observations, Section 3 of the Koukdjuak River, 16 July to 15 August, 1982.

Date	Time Slot															
1982	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
July																	
17	-	-	-	-	-	-	48	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	1	11	33	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	15	10	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-
August																	
1	-	-	-	-	4	-	-	-	4	3	-	-	-	-	-	-	-
3	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	13	23	-	-	-	-	-	-
Total	-	-	-	-	-	24	58	1	15	66	33	-	70	-	-	-	-

Total caribou observed in Section 3 - 267

Appendix B-4. Daily caribou observations, Section 4 of the Koukdjuak River, 16 July to 15 August, 1982.

Date	Time Slot																
1982	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
August																	
3	-	-	-	-	-	-	2	4	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	2	4	-	-	-	-	-	-	-	-	-

Total caribou observed in Section 4 - 6

Appendix C. Bird sightings along the Koukdjuak River, 16 July to 15 August, 1982.

Species	First sightings[a]	Eggs	Fledglings
Arctic Loon	17/07	--	--
Snow Goose	16/07	--	26/07
Common Eider	16/07	16/07	17/07
Oldsquaw	16/07	16/07	27/07
Rough Leg Hawk	17/07	--	--
Peregrine Falcon	19/07	--	--
Gyrfalcon	16/07	--	--
Willow Ptarmigan	17/07	--	--
American Golden Plover	19/07	--	--
Black-bellied Plover	25/07	--	--
Ruddy Turnstone	23/07	--	--
White-rumped Sandpiper	16/07	16/07	24/07
Red Phalarope	23/07	--	--
Parasitic Jaeger	19/07	--	--
Pomarine Jaeger	28/07	--	--
Long-tailed Jaeger	28/07	--	--
Herring Gull	16/07	17/07	02/08
Sabines Gull	16/07	17/07	23/07
Arctic Tern	16/07	16/07	16/07
Snowy Owl	21/07	--	--
Snow Bunting	16/07	--	25/07
Water Pipit	09/08	--	--
Atlantic Brant	17/07	--	--

a - All figures are given as day/month.